

RTCA Paper No. 003-07/SC209-010
Minutes of Meeting #05 of RTCA SC-209
For The Maintenance of the ATCRBS & Mode-S MOPS
<http://adsb.tc.faa.gov/SC209.htm>

SC-209 Meeting #5 was called to order by Co-Chair Thomas Pagano of the FAA Technical Center at 9:00am EST, 5 December 2006, at the facilities of RTCA in Washington DC. Mr. Pagano then welcomed all attendees and asked that each attendee introduce themselves and their organization. The attendees for all or part of the meeting included:

Mark Annee, Consultant, U.S. Navy	Peter Muraca, FAA Tech Center
Ray Bayh, BAE Systems	Tom Pagano, FAA Tech Center – AJP-1850
Lt Col. Dan Black, U.S. Air Force (phone)	Van Ruggles, Garmin International (phone)
Woody Bode, Freestate Electronics	Robert Saffell, Rockwell Collins
Bob Clarke, Alion Sciences (phone)	William Thedford, Consultant, U.S. Air Force
Rob Duffer, FAA, AIR-130	John Van Dongen, FAA TC – AJP-1850
Gary Furr, L-3/Titan, FAATC–AJP-1850	Nolan Van Foeken, Garmin International (phone)
Richard Jennings, FAA, AIR-130	Don Walker, Honeywell (phone)
Andrew Leone, FAA Tech Center (phone)	Leo Wapelhorst, L-3/Titan, FAATC-AJP-1850
Marty Lockner, NARCO Avionics (phone)	Steve Yeager, Raytheon Electronic Combat Systems

1. Agenda Item #1

- 1.1 Robert Duffer, the Designated Federal Official, also welcomed all attendees and thanked the Committee for the hard work performed during and in between the meetings. Mr Duffer thanked Don Walker of Honeywell International for providing a teleconference bridge phone line as well as access to a internet “Live Meeting” function to allow members that are not able to attend the meeting in person to participate via the Internet and telephone. Mr Duffer indicated that he will explore the possibility of the FAA providing this service for future meetings.

2. Agenda Item #2

- 2.1 With the proposed Agenda displayed, Tom Pagano asked if there were any suggested additions or changes to the Agenda for this meeting. There were no suggested changes, so Mr. Pagano declared that the Agenda was accepted as published and began to progress on the Agenda as offered to the Committee.

3. Agenda Item #3

- 3.1 Tom Pagano referred to Agenda Item #3 to discuss the Minutes of Meeting #4, which were presented to the Committee as Working Paper WP05-02. There were no comments regarding the Minutes of Meeting #4 and the Minutes were accepted by the Committee as presented in Working Paper WP05-02.

- 3.2 The Committee had a brief discussion regarding the proposed Agenda for Meeting #6 as a Joint Plenary with Eurocae WG-49. It was suggested that we should have a joint discussion on ELS/EHS requirements and test procedures, and discuss whether we should include anything in the draft of DO-181D/ED-73C on installation procedures.

4. Agenda Item #11

- 4.1 The Committee then reviewed the dates and locations of the upcoming Committee meetings. It was agreed by the Committee that meeting dates and places beyond Meeting #6 would be discussed further at Meeting #6 after a review of the status of the drafts of DO-181D and ED-73C during the Melbourne meeting. It was also discussed that it is possible that another Joint RTCA / Eurocae WG-49 meeting would be required prior to either ED-73C or DO-181D being submitted to their respective authorities for Final Review and Comment, but this decision will not be reached until a discussion can be accomplished jointly with WG-49 during Meeting #6.

Meeting	Dates/Time	Meeting Location
#6	29 Jan – 2 Feb 2007 9:00am until 5:00pm Ending @ 2:00pm 2/2/07	Joint meeting between RTCA SC-209 and Eurocae WG-49 in Melbourne Florida, hosted by Rockwell Collins at the Melbourne Crowne Plaza Oceanside
#7	TBD	TBD – to be discussed during Meeting #6 in Melbourne

5. Agenda Item #4

- 5.1 The Committee continued with the Agenda by going on to Agenda Item #4 with the review of the draft of the proposed Appendix B for the Mode-S Specific Services. Pete Muraca presented Working Paper WP05-10 as a summary presentation of the latest actions with respect to the draft of Appendix B, which was presented separately in Working Paper WP05-09. After Meeting #4, the draft of Appendix B was revised by adding the test procedures that are also presented separately in Working Paper WP05-11. After a brief discussion, the Committee agreed to keep the test procedures inside the Appendix, rather than adding another Appendix to the main document. A separate discussion was held with respect to what is in RTCA/DO-218B versus what has been currently ported into the Appendix B. The Committee agreed that it is our position to RTCA that DO-218B will be replaced and superseded by Appendix B. This will be accomplished by ensuring that all relevant sections of DO-218B have been removed and copied into Appendix B. The only open issue remaining is whether we specify the use of ADLP to load registers or whether we load registers directly.
- 5.2 The Committee stepped through the test procedures as they were presented in WP05-09. It was agreed by the Committee that references to Appendix B needed to be inserted into places within the draft of DO-181D starting near section §2.2.13.3. Action Item 5-1 was accepted by Tom Pagano and Don Walker to indicate where in the draft of DO-181D to include references to Appendix B and to capture MSP processing in the Transponder. It was further agreed that Pete Muraca would update the draft of Appendix B and return it to Gary Furr not later than 22 December for preparation and distribution to Bob Saffell and Bill Thedford for the purpose of preparing to present it during the WG-49 meeting in early January. Also, Gary Furr was requested to modify

the draft of DO-181D by adding MSP Channel Heading and a description of the TMS field information to §2.2.14.4 by copying it from the draft of Appendix B.

6. Agenda Item #10

- 6.1 The Committee continued with Agenda Item #10 with Bob Saffell presenting Working Paper WP05-06 which was a letter to ARINC regarding the Track Angle Rate Issue. The problem that Bob had identified during SC-209 Meeting #4 in Working Paper WP04-18 was described to ARINC in an email to Paul Prisaznuk of ARINC. In a response to Bob Saffell, Prisaznuk indicated that the problem would be presented during the Systems Architecture and Interfaces (SAI) Subcommittee meeting which was taking place during 5 – 7 December in San Francisco. Bob Saffell agreed to review the minutes of that SAI meeting in order to see how the problem was dealt with and report back to SC-209 during Meeting #6.

Since the SAI Meeting, Mr. Prisaznuk has advised that the appropriate ARINC documents referenced in the letter will be corrected. It was agreed that the corrections can probably be done most easily via errata pages as needed. During discussions with Mr. Prisaznuk, it was emphasized that there should be no impact to existing installations as far as we know.

7. Agenda Item #5

- 7.1 The Committee continued with the Agenda by going on to item #5 with the review of the Working Papers that will deal with issues related to the restructuring and revision of sections within the draft of DO-181D. Tom Pagano started off this discussion with his presentation in Working Paper WP05-08 giving his suggestions for breaking down Level 2 transponders. This was followed by Ray Bayh presenting his Working Paper WP05-12 on the same topic of breaking down Level 2 transponders. The Committee discussed the merits of the two different approaches, changes were made to WP05-12 during the meeting, and as a “night-time assignment” the Committee requested that Ray generate a table showing the functionality versus the proposed transponder levels. The edits during the meeting and the effort to revise the table resulted in the production of a revision to WP05-12 to be designated on the SC-209 web site as WP05-12R1. The Committee reviewed the revised table during the session on Wednesday and agreed on the basic content. Bob Saffell agreed to take the revised document and table of functionality versus transponder levels and edit it for presentation to WG-49 during their January meeting. The Committee agreed to revise the proposed text in sections §1.4.3.2 and §1.4.3.6 of the draft of DO-181D, according to the proposed changes in WP05-12R1.
- 7.2 The Committee continued with Agenda Item #5 with the review of Working Paper WP05-05, which contained the consolidated comments submitted by Committee members against the draft version 0.5 of DO-181D, which had been distributed for comment prior to the meeting. Each comment was reviewed and discussed by the Committee, and the decision of the Committee was recorded in the revised version of the Working Paper to be posted on the SC-209 web site as WP05-05R1. Some of the proposed changes suggested in the comments were implemented directly into the draft of DO-181D during the meeting, whereas other, more complicated, changes were

deferred until after the meeting. The Committee directed Gary Furr to make such changes in the draft version 0.6 of DO-181D, and revise/annotate WP05-05R1 as to the implementation of the changes.

8. Agenda Item #6.

- 8.1 The Committee continued with the Agenda by going on to item #6 with the review of the Working Papers that will deal with proposed changes to the test procedures in the draft DO-181D. John Van Dongen began with the presentation of Working Paper WP05-07, which contained suggested updates to the proposed changes to Procedure #5 for “Selective Lockout Tests” (§2.5.4.5) that reduces the test complexity by eliminating the process of starting each lockout timer with all UF codes. The Working Paper additionally proposed replacing the unnecessarily complex altitude report test procedure (Procedure #10, §2.5.4.10) with a test similar to the altitude test procedure in RTCA/DO-260A. After John’s explanation of the proposed changes and a brief discussion, the Committee agreed that the changes identified in WP05-07 could be implemented after the meeting by Gary Furr into the draft of DO-181D. These changes will be available for review in version 0.6 of the draft of DO-181D.

9. Agenda Item #8

- 9.1 During Meeting #4, Bill Thedford submitted what was identified as Working Paper WP04-21 for the purpose of updating SC-209 on an Action Item related to how transponders should handle Invalid Announced Addresses. During Meeting #4 and again during Meeting #5, Bill identified the sequence of events that are explained in the Working Paper from the initial submission of a working paper by Mikael Ponnau during WG-49 Meeting #7, through the SC-209 Meeting #3, and on to the WG-49 Meeting #8, held 4 – 6 October, and finally to the proposed text of a requirement that is presented in Working Paper WP04-21. Basically, WG-49 agreed that transponders shall not be operated as Mode-S transponders when the address is all ZEROs or all ONEs. The text of the proposed requirement states in WP04-21 that: “If the transponder 24-bit discrete address is set to all ONEs or all ZEROs at startup then this error condition shall be indicated to the pilot and the transponder shall either transition to Standby State, Power Off Condition, or operate as a pure Mode A/C transponder.” After discussion during Meeting #4, SC-209 agreed that Bill Thedford would return to WG-49 and indicate that the position of SC-209 is that SC-209 agrees with the suggested changes, as long as there is no effort on the part of regulatory authorities to require modification of units that are already in the field. Additionally SC-209 agreed during Meeting #4 to request that Bill inform WG-49 that adequate test procedures should be written to test a transponder that is allowed to operate as a pure Mode A/C transponder.
- 9.2 Since WG-49 had not had another meeting to review the proposal in WP04-21 since the SC-209 Meeting #4, this entire topic was again discussed at length during Meeting #5. Working Paper WP04-21 was reviewed again, and points of interest were again debated. Finally, the SC-209 Committee agreed to make some changes in the draft version 0.6 of DO-181D in section §2.2.13.1.1.a in order to comply as closely as

possible to the text that WG-49 wants as outlined in WP04-21. Those changes were implemented during the meeting and the text of the change was agreed to by all.

10. Agenda Item #9

- 10.1 A short discussion on the status of the draft of the DO-144A MOPS document was held on Thursday morning after a number of the parties interested in DO-144 joined the teleconference. Not much activity has happened with DO-144A since the teleconference that occurred on November 1, 2006. Rich Jennings agreed to try to set up a meeting specifically for the DO-144 parties in the early February 2007 time frame to go over the existing draft of the DO-144A MOPS, and edit it as required.

11. Agenda Item 13

- 11.1 The topic of a control being available to the pilot to “turn off” the ADS-B function was raised and discussed. Manufacturers indicated that they are beginning to receive questions with respect to this topic from people who are attending meetings related to the CDTI and ASSAP MOPS. Upon making a phone call Rich Jennings reported that a function is being required in the NPRM for this ON/OFF switch, and Rich indicated that he would discuss the issue with the NPRM people and report back to the Committee at the next Meeting in Melbourne.

Gary Furr researched the topic in both the UAT and 1090ES MOPS documents and reports the following:

- (1) Both MOPS documents contain numerous “optional” requirements in Section 4 which relate to the halting of ADS-B transmissions. Sections entitled “Power On/Off (Optional)” indicate that aircraft with limited electrical systems may employ ADS-B system power controls for energy conservation, and that these power controls should be designed so as to prevent the system from being turned OFF inadvertently. (DO-260A, §4.4.1 and DO-282A, §4.2.1.4)
- (2) Both MOPS documents contain a requirement in section 4 entitled “Standby” which indicates that: “A means shall be provided for the flight crew to select a standby mode in which ADS-B transmissions are inhibited. Reception of messages and report generation may continue.” (DO-260A, §4.4.6 and DO-282A, §4.1.4)
- (3) Both MOPS documents contain an “optional” requirement in section 4 entitled “Link Control (Optional)” which indicates that: “A means may be provided for the flight crew to disable the ADS-B Link.” (DO-260A, §4.4.5 and DO-282A, §4.1.3)

During discussions, manufacturers reported that this is not an easy problem to solve. They indicated that currently in transponders there is no capability to turn off the ADS-B transmissions while still allowing the transponder to operate as a Mode-S transponder.

12. Gary Furr agreed to make the updates to the draft of DO-181D as agreed to during the meeting and to send out the draft to Bill Thedford for the purpose of having Bill use the latest version to run the comparison database between DO-181D and ED-73C for a report during Meeting #6 in Melbourne.

13. The list of open Action Items was not specifically reviewed during SC-209 Meeting #5, however the summary of Action Items that remained open, or were newly recorded as being assigned and accepted during Meeting #5 are as follows:

Action Number	Open Action Item Descriptions	Assigned to	Status
1-3	Coordinate with Stuart Searight to make sure that all of the TCAS issues are accounted for.	Tom Pagano Gary Furr	Ongoing
2-2	Resolve the differences in the "Reply Rate" requirements in the following sections: (1) DO-181C, §2.2.3.4.1, (2) ED-73B, §3.4.1, (3) SARPs Annex 10, Vol-IV, §3.1.1.7.9	Doug Guetter Bob Saffell	
2-6	Further the restructuring section §2.2 of DO-181 for Meeting #3	Bayh, Saffell, Annee, Guetter	Ongoing
3-1	Create a Working Paper which will be submitted to the ICAO ASP TSG which identifies those proposed changes that have been discussed in the revised set of comments. Saffell created WP04-06 and WP04-07 and presented them to WG-49, but more needs to be done with respect to comments 12 through 18 in WP03-04R1. For Meeting #5 Don Walker will prepare a Working Paper for SC-209 to review prior to submitting it to the ICAO ASP TSG in January 2007.	Don Walker Bob Saffell John Berglund Doug Guetter	Ongoing
3-2	Call manufacturers to try to get more participation in the effort to revise DO-144	Rob Duffer Rich Jennings	Ongoing
3-3	Approach Kevin Hallworth at EASA with the points of discussion regarding the differences in DO-181D and ED-73C and the SARPs on the P4 issue	Rob Duffer	
3-4	Review the proposed changes to the test procedures in §2.4.2.7 with his transponder and DME experts to see what they think about the proposed changes	Bob Saffell	
4-1	Begin with WP04-08 and draft requirements for sections 2.2.24 and 2.2.25 of the draft of DO-181D prior to Meeting #5.	Bob Saffell	
4-2	Begin drafting test procedures for sections 2.4.24 and 2.4.25 of the draft of DO-181D prior to Meeting #5, using data items contained in WP04-10.	Bob Saffell	
4-4	Prepare a Working Paper to be presented during the WG-49 Meeting #9 in January 2007 regarding the agreed upon breakdown of transponder Level 2 into categories of 2a, 2b & 2c in preparation for additional presentation to the ICAO ASP TSG meeting in Fort Lauderdale.	Bob Saffell	
5-1	Modify the draft of DO-181D to include references to Appendix B and capture MSP processing in the Transponder.	Tom Pagano Don Walker	
5-2	Review all of Section 1 for revisions/additions	Tom Pagano	

14. The **Working Papers** for all SC-209 Meetings, as well as the Meeting Agendas, Meeting Minutes, Meeting Schedules and proposed modifications to the ATCRBS and Mode-S MOPS will be posted on the web site maintained by Gary Furr at the FAA William J Hughes Technical Center, located at:

<http://adsb.tc.faa.gov/SC209.htm>

As reported in the Meeting Summary of Eurocae WG-49, Meeting #6, members of SC-209 may access the WG-49 workspace through the Eurocae web site located at:

<http://www.eurocae.org/> Login: WG49 and password: MODE-S

Also, the workspace of Eurocae WG-51 can be accessed by SC-209 members through the same Eurocae web site with: Login: WG51 and password: ADSB